

### Claims

1. A journal turning lathe for machining cylindrical work pieces comprising:
  - (a) first and second clamping rings that are held in concentric alignment at spaced apart positions by a plurality of circumferentially spaced guide shafts, the first and second clamping rings adapted to surround and clamp to the cylindrical work piece;
  - (b) a clamshell assembly slidingly supported on a plurality of guide shafts; and
  - (c) a drive assembly for imparting controlled translational movement of the clamshell assembly along the plurality of guide shafts between the first and second clamping rings, the drive assembly including at least two circumferentially spaced lead screws journaled for rotation at opposite ends thereof in the first and second clamping rings, each lead screw having a traveling nut thereon operatively engaging the clamshell assembly, said drive assembly further including a drive motor operatively coupled to simultaneously rotate the at least two lead screws in unison.
2. The journal turning lathe as in claim 1 wherein the first clamping ring comprises a stationary ring adapted to be clamped to the cylindrical work piece and a rotatable ring journaled for rotation on the stationary ring, the rotatable ring have gear teeth on the peripheral surface thereof.
3. The journal turning lathe as in claim 2 wherein said drive motor includes a spur gear on an output shaft thereof and is coupled to the stationary ring with the spur gear forming part of a gear train that engages the gear teeth on the peripheral surface on the rotatable ring.
4. The journal turning lathe as in claim 2 wherein said drive motor includes a plurality of drive gears mounted on an output shaft thereof which are coupled to a spur gear and said spur gear is coupled to the stationary ring with the drive gears and the spur gear forming a part of a gear train that engages the gear teeth on the peripheral surface of the rotatable ring.

5. The journal turning lathe as in claim 3 wherein the gear train affects a speed reduction between the drive motor's speed and the speed at which said rotatable ring is driven.
6. The journal turning lathe as in claim 4 wherein the gear train affects a speed reduction between the drive motor's speed and the speed at which said rotatable ring is driven.
7. The journal turning lathe as in claim 2 and further including a spur gear on at least two lead screws that each operatively engage the gear teeth on the peripheral surface on the rotatable ring.
8. The journal turning lathe as in claim 2 and further including:
- (a) at least two pinion gears each operatively engaging the gear teeth on the peripheral surface of the rotatable ring; and
  - (b) a spur gear coupled to the at least two lead screws wherein said spur gears each engage the gear teeth on the pinion gears.
9. The journal turning lathe as in claim 3 and further including a spur gear on at least two lead screws that each engage the gear teeth on the peripheral surface of the rotatable ring.
10. The journal turning lathe as in claim 5 and further including a spur gear on the at least two lead screws that each engage the gear teeth on the peripheral surface of the rotatable ring.
11. The journal turning lathe as in claim 1 wherein the clamshell assembly comprises a non-rotatable ring and a rotatable ring, with the traveling nut engaging the non-rotatable ring and the rotatable ring supporting a cutting tool carrier thereon.
12. The journal turning lathe as in claim 11 wherein the rotatable ring includes gear teeth on a peripheral surface thereon and the non-rotatable ring supports a second drive motor having a gear on the output shaft of the second drive motor for operatively engaging the gear teeth on the peripheral surface of the rotatable ring.
13. The journal turning lathe as in claim 11 wherein the cutting tool carrier includes a slide mechanism for carrying a cutting tool and imparting controlled radial displacement of said cutting tool.

14. The journal turning lathe as in claim 1 wherein the first and second clamping rings and said clamshell assembly each comprise two semi-circular members and each of the semi-circular members supports two of said plurality of guide shafts.

5 15. The journal turning lathe as in claim 14 and further including adjustable centering bolts disposed in threaded bores formed readily through the first and second clamping ring for concentrically mounting the journal turning lathe on the cylindrical work piece.